

Sample Calculations for Lab 08

Be sure to include correct units with your calculations

(1) An inductor has $L=470 \mu\text{H}$ and a capacitor has $C=470 \mu\text{f}$. If these two elements are in series, calculate the resonant frequency (f) of the circuit.

(2) if the inductor and capacitor are placed in a circuit with a resistor $R=100\Omega$, calculate the following at $f=60 \text{ Hz}$:

X_c

X_L

Z

$\tan \phi$

the power factor

(3) Suppose an AC voltage has $V_m=10 \text{ V}$ and is operated at a frequency of $f=60 \text{ Hz}$. The voltage is applied to the series RLC circuit with the elements given above.

Calculate V_{RMS}

Calculate I_{rms} from $V_{\text{rms}} = I_{\text{rms}} Z$

Calculate the time average power $\langle P \rangle$ radiated by the resistor.